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CLAIMS

1. A process for the treatment of at least one thin brittle metal strip (1, 21a, 21b, 30) having a thickness of less than 0.1 mm, comprising at least one step in which the thin strip (1, 21a, 21b, 21c, 30) is subjected to stresses, characterized in that, prior to the step of the process in which the thin strip (1, 21a, 21b, 21c, 30) is subjected to stresses, at least one side of the strip is covered with a coating layer (3, 3', 13, 13', 31) made of at least one polymer material so as to obtain, on the strip, an adhesive layer having a thickness of between 1 and 100 µm, modifying the deformation and fracture properties of the thin metal strip, and in that the step of the process in which the thin strip is subjected to stresses is carried out on the strip covered with the coating layer.

2. The process as claimed in claim 1, characterized in that the coating layer (3, 3') made of at least one polymer material consists of a self-adhering plastic film precoated with adhesive.

3. The process as claimed in claim 2, characterized in that the self-adhering plastic film precoated with adhesive comprises a layer of a pressure-sensitive self-adhering substance and in that the self-adhering coating layer (3, 3') is made to adhere to the thin metal strip (1) by pressing the coating layer (3, 3') onto the thin metal strip (1).

4. The process as claimed in either of claims 2 and 3, characterized in that the plastic film consists of one of the following materials:

polyester, polytetrafluoroethylene, polyimide.

5. The process as claimed in any one of claims 2 to 4, characterized in that one side of the thin brittle metal strip (1) is brought into contact with a first self-adhering polymer film (3), the nanocrystalline strip (1) thus being able to be handled, in that the second side of the thin brittle metal strip (1) is brought into contact with a second film (3') made of a self-adhering plastic, in that pressure is applied to the laminated strip (6) consisting of the thin brittle metal strip (1) between the two films of polymer material (3, 3') and in that a mechanical operation, for example a cutting operation, is carried out on the laminated strip (6).

6. The process as claimed in any one of claims 2 to 4, characterized in that a plurality of laminated strips (6, 7a, 7b, 7c) each having a coating layer consisting of a plastic film precoated with a pressure-sensitive adhesive on at least one of its sides are produced, in that the plurality of laminated strips (6, 7a, 7b, 7c) are superposed and joined together by adhesion in order to obtain a laminated composite strip (11) and in that a mechanical operation, for example a cutting operation, is carried out on the laminated composite strip (11).

7. The process as claimed in any one of claims 2 to 6, characterized in that the pressure-sensitive adhesive substance of the self-adhering plastic film precoated with adhesive is a crosslinkable substance and in that a crosslinking heat treatment is carried out on the coating layer adhering to the thin metal strip.

8. The process as claimed in claim 1, characterized in that the coating layer comprising at least one polymer material consists of a thermoplastic non-self-adhering polymer film precoated with adhesive on one of its faces, in that such a thermoplastic film precoated with adhesive is brought into contact with at least one of the sides of the thin metal strip (1) in order to obtain a laminated strip (7a, 7b, 7c), in that a plurality of laminated strips (7a, 7b, 7c) are manufactured in this way, in that the plurality of laminated strips (7a, 7b, 7c) are heated to a temperature of less than 400°C, in that the strips of the plurality of laminated strips (7a, 7b, 7c) heated to obtain a composite laminated strip (11) are superimposed and compressed one against another, and in that a process step involving stresses, such as a cutting operation, is carried out on the composite laminated strip (11).

9. The process as claimed in claim 8, characterized in that the thermoplastic film is made of one of the following polymer materials: polyethylene modified by acrylic acid or maleic anhydride; grafted polypropylene; polyamide; polyurethane

10. The process as claimed in claim 1, characterized in that the coating layer comprising at least one polymer material consists of a reactive adhesive polymer material, in that the coating layer is deposited on at least one of the sides of the thin brittle metal strip (1), in order to obtain a laminated strip (16), in that a plurality of laminated strips (16a, 16b, 16c) is produced in this way, in that the laminated strips (16a, 16b, 16c) are heated to a temperature of less than

400°C, in that the laminated strips (16a, 16b, 16c) are superposed in the heated state, in that pressure is exerted on the superposed strips (16a, 16b, 16c) in order to achieve the adhesion of the laminated strips (16a, 16b, 16c), in order to obtain a laminated composite strip (17), and in that an operation involving mechanical stresses, such as a cutting operation, is carried out on the composite laminated strip (17).

11. The process as claimed in claim 9, characterized in that the reactive adhesive coating consists of one of the following polymer materials: acrylic material, polyester, epoxy resin, phenolic epoxy resin, polyester/epoxy resin, phenolic resin with modifier, polyurethane/polyester resin.

12. The process as claimed in either of claims 10 and 11, characterized in that the reactive adhesive polymer material is deposited on at least one side of the thin metal strip (1) by one of the following processes: coating, spraying, dipping.

13. The process as claimed in any one of claims 1 to 11, characterized in that thin brittle metal strip (1) is a strip made of a soft magnetic alloy having a nanocrystalline structure, that is to say containing at least 50 vol % of fine crystals having a size of less than 100 nm, obtained by casting the soft magnetic material in the form of an amorphous strip and by heat treatment of the amorphous strip, the thin metal strip (1) being covered, in one of its amorphous or nanocrystalline states, on at least one side with a coating layer comprising at least one polymer material.

14. The process as claimed in claim 13, characterized in that the coating layer comprising a polymer material has a thickness of between 1 and 50 µm.

15. The process as claimed in either of claims 13 and 14, characterized in that the thin strip of nanocrystalline material has a thickness of around 20 µm.

16. The process as claimed in any one of claims 13, 14 and 15, characterized in that the soft magnetic material contains iron, copper, niobium, silicon and boron, or iron, zirconium, boron and possibly copper and silicon.

17. The process as claimed in claim 16, characterized in that the atomic composition of the soft magnetic alloy is, for example, of the Fe-Cu-Nb-B-Si type or of the Fe-Zr-(Cu)-B-(Si) type or of another type.

18. The process as claimed in any one of claims 13 to 17, characterized in that the strip of soft magnetic material is covered in the amorphous state with a complex mixture consisting of solvents, polymer binders, aluminates, silicates and fluxes, in that the strip covered with the coating layer is dried; in that a plurality of coated and dried amorphous strips are produced, in that the plurality of coated amorphous strips are superposed, in that the coated amorphous strips undergo a first curing operation, in order to obtain an amorphous/polymer composite laminated strip, in that components are cut from the composite strip, in that the cut components are heat treated at a temperature allowing a nanocrystalline structure to develop in the

amorphous strips and allowing the aluminate/silicate/flux mixture to vitrify, in order to obtain cut shaped components comprising laminated nanocrystalline layers and vitrified layers.

19. The process as claimed in claim 18, characterized in that a resin of the ethylcellulose type, solvents consisting of a mixture of aliphatic or aromatic hydrocarbons, a mineral filler consisting of glasses or oxides, and an organic filler consisting of organometallic or surfactant substances are used in the mixture for covering the strip (1).

20. The process as claimed in any one of claims 1 to 19, characterized in that that step in which the thin strip (1) is subjected to stresses is a mechanical cutting operation.

21. The process as claimed in any one of claims 1 to 19, employing a step of chemically cutting a thin metal strip (30) coated on one of its sides with a coating layer (31) made of polymer material.

22. The process as claimed in claim 1 for the production of a component (44) of a printed circuit, comprising at least one winding (42, 43), such as a transformer (44), characterized in that:
- a laminated strip (36) consisting of a strip (36a) made of nanocrystalline alloy and of a film of polymer material (36b) adhering to one of the sides of the strip of nanocrystalline alloy is produced;
- the strip made of nanocrystalline alloy is cut in order to obtain a plurality of magnetic circuits (37) made of nanocrystalline alloy each

adhering to one section of the film of polymer material (36b);
- a plurality of sections are cut from the film of polymer material;
- the plurality of sections are stacked so that the magnetic circuits (37) are exactly superposed and the sections of the film of polymer material are made to adhere to one another in order to obtain a composite laminated product (40);
- the sections of films made of polymer material are drilled over the entire thickness of the laminated composite product (40) in order to produce through-holes (41) in regions located within the magnetic circuits (37) and in regions located outside said magnetic circuits (37);
- in that the through-holes (41) are internally metallized; and
- electrical conductors are produced on both sides of the composite laminated product (40), said electrical conductors joining the ends of the holes (41), in the form of at least one winding (42, 43).

23. A magnetic component made of a magnetic alloy in nanocrystalline form, characterized in that it is produced in a laminated form and in that it comprises at least one strip made of a magnetic material in nanocrystalline form and at least one coating layer comprising at least one polymer material superposed on the strip made of nanocrystalline magnetic alloy and adhering to this strip made of nanocrystalline magnetic alloy.

24. The magnetic component as claimed in claim 23, characterized in that it constitutes a flat transformer component (26a, 26b, 26c) having the shape of an E, an I or a U.

25. The magnetic component as claimed in claim 23, characterized in that it constitutes a toric magnetic core (27a, 27b, 27c) in the form of a washer or in the form of a square or rectangular frame.

26. The magnetic component as claimed in claim 25, characterized in that it constitutes a slit torus (27c) having a gap (27c) in the radial direction.

27. The magnetic component as claimed in claim 23, characterized in that it constitutes one of the following elements: a magnetic circuit component for the rotors or stators of watches, the rotor or stator of an electric motor, an antitheft label, a magnetic component such as an inductor or transformer, in particular a thin inductor or transformer having a thickness of the order of one millimeter.

28. The magnetic component as claimed in claim 23, characterized in that it constitutes a transformer (44) integrated into a printed circuit or a discrete transformer.

29. A laminated strip consisting of at least one strip made of nanocrystalline alloy covered on at least one of its sides with a coating layer comprising at least one polymer material.